Meadowood Global Climate Change Analysis County of San Diego GPA04-002, SPA04-001, R04-004, VTM 5354RPL², S04-005, S04-006, S04-007 and ER No. 04-02-004

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ATTACHMENTS

1: URBEMIS Output Files
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TERMS AND ACRONYMS

ADT	Average Daily Trips
AB 32	Assembly Bill 32
CARB	California Air Resources Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CCAP	Climate Change Action Plan
CH_4	Methane
CO_2	Carbon dioxide
CO_2 Eq	Equivalent Carbon Dioxide
GHG	Greenhouse gas
GWP	Global warming potential
HFC	hydrofluorocarbons
I-15	Interstate 15
kWh	kilowatt hours
MWD	Municipal Water District
MWh	Megawatt hours
N_2O	Nitrous oxide
LCFS	Low Carbon Fuel Standard
mpg	miles per gallon
ODS	Ozone depleting substances
PFC	perfluorocarbons
SF_6	sulfur hexafluoride
VMT	Vehicle miles traveled
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
WARM	Waste Reduction Model
° F	degrees Fahrenheit

EXECUTIVE SUMMARY

This report evaluates the potential global climate change impacts associated with the Meadowood Project (Proposed Project). An assessment was made to estimate the total greenhouse gas (GHG) emissions that would be emitted as a result of construction and operation of the Proposed Project. Construction sources of GHG emissions include heavy construction equipment, worker Vehicle Miles Traveled (VMT), and water use. Operational sources of GHG emissions sources include energy, transportation, and solid waste.

While there is no set threshold for GHG emissions, given the State of California's mandated goal of reducing statewide GHG emissions to 1990 levels, the incremental increase of GHG emissions resulting from operation of the Proposed Project may be considered cumulatively significant.

The report, *The California Environmental Quality Act; Addressing Global Warming Impacts at the Local Agency Level* (State of California 2008) provides a list of measures appropriate for the Proposed Project that minimizes the significant effect of global climate change. The Proposed Project as currently envisioned incorporates many of these measures. Thus, with the implementation of these measures, global climate change impacts from the Proposed Project would be reduced to less than significant.

1.0 INTRODUCTION

1.1 Purpose of the Report & Regulatory Background

1.1.1 Regulatory Framework

The earth's climate is in a state of constant flux, with periodic warming and cooling cycles. Extreme periods of cooling are termed "ice ages," which may then be followed by extended periods of warmth. For most of the earth's geologic history, these periods of warming and cooling have been the result of many complicated, interacting natural factors that include volcanic eruptions which spew gases and particles (dust) into the atmosphere, the amount of water, vegetation, and ice covering the earth's surface, subtle changes in the earth's orbit, and the amount of energy released by the sun (sun cycles). However, since the beginning of the Industrial Revolution around 1750, the average temperature of the earth has been increasing at a rate that is faster than can be explained by natural climate cycles alone.

With the Industrial Revolution came an increase in the combustion of carbon-based fuels such as wood, coal, oil, and "biofuels." Industrial processes have also created emissions of substances that are not found in nature. This in turn has led to a marked increase in the emissions of gases that have been shown to influence the world's climate. These gases, GHG, influence the amount of heat that is trapped in the earth's atmosphere. Because recently observed increased concentrations of GHG in the atmosphere are related to increased emissions resulting from human activity, the current cycle of "global warming" is generally believed to be largely due to human activity. Of late, the issue of "global warming" has arguably become the most important and widely debated environmental issue in the United States and the world.

The Coordinating Committee on the Ozone Layer was established by the United Nations Environment Program (UNEP) in 1977, and UNEP's Governing Council adopted the World Plan of Action on the Ozone Layer. Continuing efforts led to the signing in 1985 of the Vienna Convention on the Protection of the Ozone Layer. This led to the creation of the Montreal Protocol on Substances That Deplete the Ozone Layer (Montreal Protocol), an international treaty designed to protect the stratospheric ozone layer by phasing out production of ozone depleting substances (ODSs). The treaty was adopted on September 16, 1987, and went into force on January 1, 1989.

Similar to the events that led to the Montreal Protocol, to address growing concern about global climate change, 191 countries, including the United States, joined an international treaty known as the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC recognizes that the global climate is a shared resource that can be affected by industrial and other emissions of greenhouses gases, and that set an overall framework for intergovernmental efforts to tackle the challenges posed by global climate change. Under this treaty, governments gather and share information on GHG emissions, national policies and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change. UNFCCC entered into force on March 21, 1994. However, this treaty generally lacked powerful, legally binding measures. This led to the development of the Kyoto Protocol.

The Kyoto Protocol was adopted in December 1997. While the 1997 Kyoto Protocol shares the UNFCCC's objective, principles, and institutions, it significantly strengthens the UNFCCC by committing industrialized countries to individual, legally binding targets to limit or reduce their GHG emissions. Only parties to the UNFCCC that have also become Parties to the Protocol are bound by the Protocol's commitments. Parties become Parties to the Protocol by either ratifying, accepting, approving, or acceding to it.

The U.S. developed the Climate Change Action Plan (CCAP). The CCAP consists of initiatives that involve all economic sectors and aim at reducing all significant GHGs. The CCAP, backed by federal funding, cultivates cooperative partnerships between the government and the private sector to establish flexible and cost-effective ways to reduce GHG emissions within each sector. The CCAP encourages investments in new technologies, but also relies on previous actions and programs focused on saving energy and reducing emissions.

The State of California has passed a number of policies and regulations that are either directly or indirectly related to GHG emissions. California Code of Regulations, Title 24, Part 6 is the California Energy Code. This code, originally enacted in 1978 in response to legislative mandates, establishes energy efficiency standards for residential and non-residential buildings in order to reduce California's energy consumption. The Code is updated periodically to incorporate and consider new energy efficiency technologies and methodologies as they become available. The most recent amendments to the Code are dated September 11, 2006. By reducing California's energy consumptions, emissions of GHGs may also be reduced.

California Assembly Bill 1493 was enacted on July 22, 2002. It required the California Air Resources Board (CARB) to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Regulations adopted by CARB will apply to 2009 and later model year vehicles.

Executive Order S-3-05, signed by Governor Schwarzenegger on June 1, 2005, established the following GHG emission reduction targets for the state of California:

- by 2010, reduce GHG emissions to 2000 levels;
- by 2020 reduce GHG emissions to 1990 levels;
- by 2050 reduce GHG emissions to 80 percent below 1990 levels.

This executive order also directs the secretary of the California Environmental Protection Agency to oversee the efforts made to reach these targets, and to prepare biannual reports on the progress made toward meeting the targets and on the impacts to California related to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. With regard to impacts, the report shall also prepare and report on mitigation and adaptation plans to combat the impacts.

In response to Executive Order S-3-05, the California legislature passed Assembly Bill 32 (AB 32), the "California Global Warming Solutions Act of 2006," which was signed by the governor on September 27, 2006. It requires the CARB to adopt rules and regulations that would reduce GHG emissions to 1990 levels by 2020.

Executive Order S-01-07, signed by Governor Schwarzenegger on January 18, 2007, directs that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. It orders that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California and directs the CARB to determine if a LCFS can be adopted as a discrete early action measure pursuant to AB 32. [The CARB approved the LCFS as a discrete early action item with a regulation to be adopted and implemented by 2010 at its June 2007 hearing.] EO S-01-07 also instructs the California Environmental Protection Agency to coordinate activities between the University of California, the California Energy Commission, and other state agencies to develop and propose a draft compliance schedule to meet the 2020 target.

1.1.2 Greenhouse Gases

There are numerous GHGs, both naturally occurring and artificial. Table 1 summarizes some of the most common.

TABLE 1
GLOBAL WARMING POTENTIALS (GWP) AND ATMOSPHERIC LIFETIMES (YEARS)

Gas	Atmospheric Lifetime (Years)	100-year GWP[a]
Carbon Dioxide (CO_2)	50-200	1
Methane (CH_4)[b]	12±3	21
Nitrous oxide (N_20)	120	310
HFC-23	264	11,700
HFC-125	32.6	2,800
HFC-134a	14.6	1,300
HFC-143a	48.3	3,800
HFC-152a	1.5	140
HFC-227ea	36.5	2,900
HFC-236fa	209	6,300
HFC-4310mee	17.1	1,300
CF_4	50,000	6,500
C_2F_6	10,000	9,200
C_4F_{10}	2,600	7,000
C_6F_{14}	3,200	7,400
SF_6	3,200	23,900

SOURCE: U.S. EPA 2002.

[a] GWPs used here are calculated over 100-year time horizon.

[b] The methane GWP includes the direct effects and those indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

Of the gases listed in Table 1, carbon dioxide, methane, and nitrous oxide are produced by both natural and anthropogenic (human) sources. The remaining gases (hydrofluorocarbons [HFCs; such as HFC-23], perfluorocarbons [PFCs; such as CF_4], and sulfur hexafluoride [SF_6]), are the result of human processes.

The potential of a gas to trap heat and warm the atmosphere is measured by its global warming potential (GWP). GHG either breakdown or are absorbed over time. Thus, the potential of a gas to contribute to global warming is limited by the time it is in the atmosphere, its "atmospheric lifetime." To account for these effects, GWPs are

calculated over a 100-year time horizon (U.S. EPA 2002). Because of its relative abundance in the atmosphere and its relatively long atmospheric lifetime, carbon dioxide has been designated the reference gas for comparing GWPs. Thus, the 100-year GWP of CO_2 is equal to one (see Table 1).

The increase in the earth's temperature is expected to have wide ranging effects on the environment. Although global climate change is anticipated to affect all areas of the globe, there are numerous implications of direct importance to California. Statewide average temperatures are anticipated to increase by between 3 and 10.5 degrees Fahrenheit (° F) by 2100. Some climate models indicate that this warming may be greater in the summer than in the winter. This could result in widespread adverse impacts to ecosystem health, agricultural production, water use and supply, and energy demand. Increased temperatures could reduce the Sierra Nevada snowpack and put additional strain on the region's water supply. In addition, increased temperatures would be conducive to the formation of air pollutants resulting in poor air quality.

It is also important to note that even if GHG emissions were to be eliminated or dramatically reduced, it is projected that the effect of those emissions would continue to affect global climate for centuries.

1.2 Project Location and Description

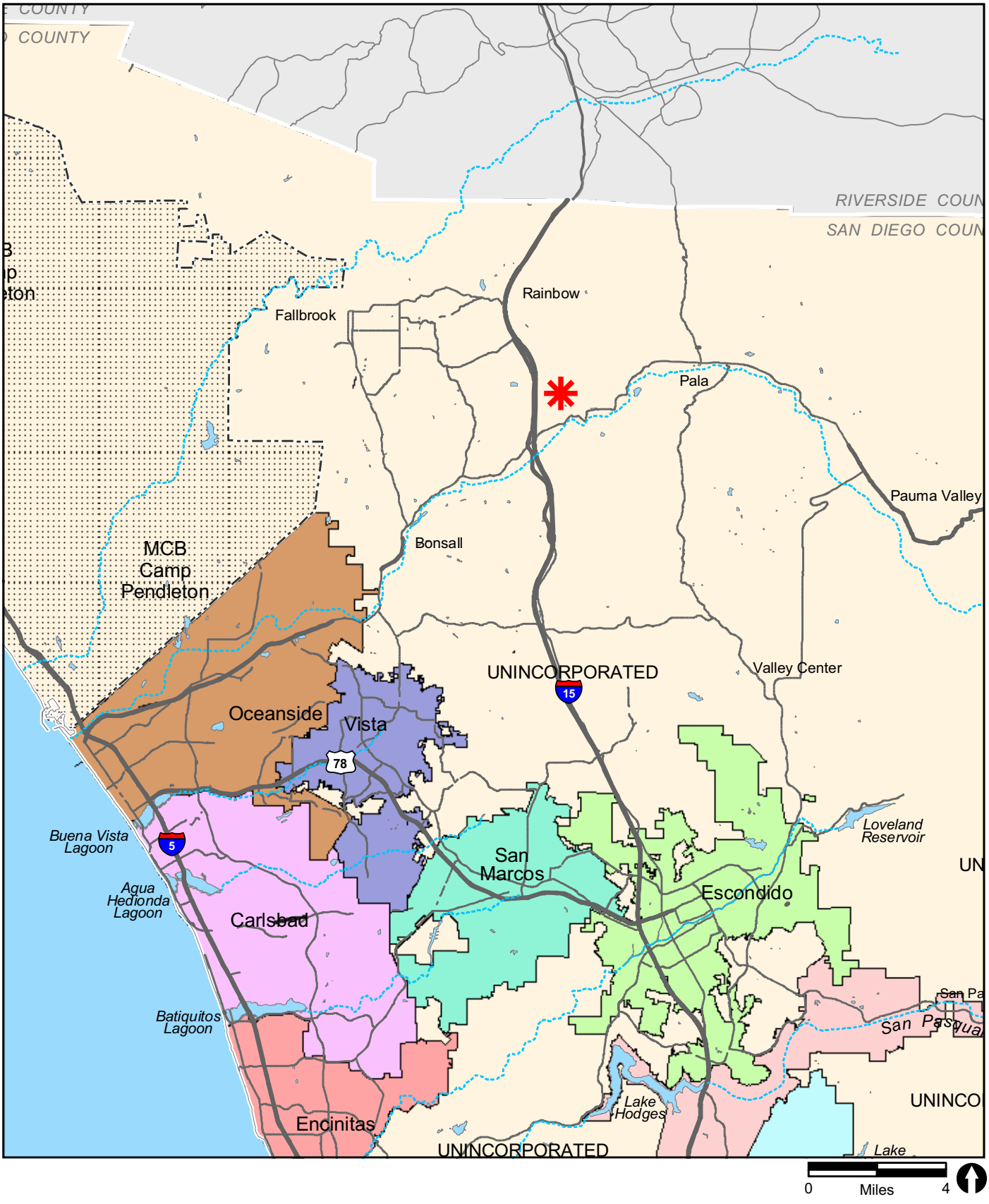
The Proposed Project is located to the north of State Route 76, and east of Interstate 15 (I-15) in the county of San Diego. The parcels are situated between several planned projects: Palomar College Campus, Campus Park and Campus Park West. South and east is the approved Rosemary's Mountain Rock Quarry. Located to the north and east is land that is largely undeveloped and consists of citrus and avocado orchards and natural open space.

The Proposed Project entails construction of 844 single- and multi-family homes, a school, park, and open space. Figure 1 shows the regional location of the Proposed Project. Figure 2 shows the project boundary plotted on an aerial photograph of the project vicinity. Figure 3 shows the site plan for the Proposed Project.

2.0 POTENTIAL CLIMATE CHANGE IMPACTS ON PROJECT SITE

The anticipated consequences of global climate change have the potential to result in adverse impacts to the Proposed Project. Statewide average temperatures are anticipated to increase by between 3–10.5°F by the year 2100. This could result in widespread adverse impacts to ecosystem health, agricultural production, water use and supply, and energy demand. Increased temperatures could reduce the Sierra Nevada snowpack and put additional strain on the region's water supply. In addition, increased temperatures would be conducive to the formation of air pollutants resulting in poor air quality.

Future residents of the Proposed Project could be exposed to increased risk of dehydration, heat stroke, heat exhaustion, heart attack, stroke, and respiratory disease. However, these risks would be no different from those experienced by the San Diego region as a whole. Increased temperatures would result in more frequent use of air conditioning that would increase energy costs to residents and that could put a strain on



Project location

FIGURE 1

Regional Location

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Project Boundary

FIGURE 2

Aerial Photograph of Project

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Project Boundary

Plan Lines

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FIGURE 3

Site Plan

the area's energy supplies. Because the Proposed Project is located inland well above sea level, no impacts related to sea level rise are anticipated.

3.0 SIGNIFICANCE CRITERIA & ANALYSIS METHODOLOGIES

3.1 Guidelines for Determining Significance

There are currently no published thresholds or recommended methodologies for determining the significance of a project's potential contribution to global climate change in documents prepared pursuant to the California Environmental Quality Act (CEQA), and no uniformly accepted approach has been developed for assessing a project's potential impacts relative to global climate change.

CARB has prepared *Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act* (State of California 2008). This draft document is intended as a resource, not a guidance document.

The major emission sub-sources for residential and commercial uses include energy use, transportation, water use, waste, and construction. CARB has identified the California Energy Commission's (CEC) Tier II Energy Efficiency goals as an appropriate performance standard for energy use. Currently, the CEC recommends a Tier II goal for residential and commercial projects of a 30 percent reduction in building combined space heating, cooling, and water heating energy compared to Title 24 standards. These standards are consistent with what is needed to meet the state's goal of zero net energy buildings and are continuously updated to reflect energy efficiency best practices. For the purposes of this analysis, a 30 percent reduction over Title 24 standards was used as a significance threshold. CARB intends to compile performance standards for the remaining emission sub-sources. The analysis in this report includes an emissions assessment and a qualitative impact assessment based on recommendations in the CARB report, as well as a discussion of measures that have been incorporated into the project design that would reduce GHG emissions.

3.2 Methodology & Assumptions

GHG emissions were calculated using several sources. Emissions of CO_2 due to construction of the Proposed Project were calculated using the URBEMIS 2007 computer program. It was assumed that construction would begin in January 2012 and last until year 2025.

To calculate GHG emissions due to operation of the Proposed Project, average electricity, natural gas, and water usage factors published by the U.S. EPA and the U.S. DOE. Vehicle emissions were estimated using the emission factors developed by the Bay Area Air Quality Management District and the total VMT per day estimated by the URBEMIS 2007 computer program for the Proposed Project. The EPA Waste Reduction Model ([WARM]; U.S. EPA 2008) was used to calculate the GHG emissions due to solid waste generated by the Proposed Project. Each of these is discussed below.

4.0 GREENHOUSE GAS INVENTORY

An assessment was made to estimate the total GHG emissions that would be emitted as a result of construction and operation of the Proposed Project. Construction sources of GHG emissions include heavy construction equipment, worker VMT, and water use. Operational sources of GHG emissions include energy, transportation, and solid waste.

The three primary GHGs that would be emitted by the Proposed Project are CO_2, CH_4, and N_2O. As discussed above, these GHGs have varying amounts of GWP. As shown in Table 1, the 100-year GWP for CO_2, CH_4, and N_2O are 1, 21, and 310, respectively. GHG emission factors are summarized in Table 2.

TABLE 2
GHG EMISSION FACTORS

Gas	Vehicle Emission Factors (pounds/gallon)[1]	Electricity Generation Emission Factors (pounds/MWh)[2]	Natural Gas Combustion Emission Factors (pound/million ft^3)[3]
Carbon Dioxide	19.564	1,340	120,000
Methane	0.00055	0.0111	2.3
Nitrous Oxide	0.0002	0.0192	2.2

[1]SOURCE: BAAQMD 2006.
[2]SOURCE: U.S. DOE 2002.
[3]SOURCE: U.S. EPA 1998.

Below is a summary of the GHG emissions due to construction and operation of the Proposed Project. Emissions were calculated for "business as usual" conditions. "Business as usual" is considered to be development according to the current energy efficiency standards established in Title 24. The Proposed Project would incorporate measures into the project design that would reduce emissions from "business as usual" conditions. These measures are also discussed.

4.1 Construction GHG Emissions

Construction GHG emissions could result from heavy construction equipment, worker VMT, and water usage. Emissions of CO_2 during construction of the Proposed Project were calculated using the URBEMIS 2007 computer program (Rimpo and Associates 2008). The Proposed Project would emit 9,169 pounds per day of CO_2 during each year from 2012 through 2016 during grading of the Project Site, and approximately 25,890 pounds per day of CO_2 during each year from 2017 through 2024. This is equivalent to 1,518 metric tons per year from 2012 through 2016 and 4,286 metric tons per year from 2017 through 2024. URBEMIS 2007 output are contained in Attachment 1.

4.2 Operational GHG Emissions

4.2.1 Energy

Energy emissions are due to electricity, natural gas, and water use. Each is discussed below.

4.2.1.1 Electricity

Due to the nature of the electrical grid, it is not possible to say with certainty exactly where this power will be generated. Therefore, GHG emissions resulting from electricity generation associated with the Proposed Project were estimated using national average emission factors developed by the U.S. Department of Energy (U.S DOE 2002) and existing electricity consumption rates. In 2006, the average electricity consumption for a residential consumer was 7,080 kilowatt hours (kWh) per year, and the average electricity consumption for a commercial consumer was 69,216 kWh per year (U.S. DOE 2006). For the purposes of this analysis, it was assumed that the electricity consumption for the proposed school would be the same as for a commercial consumer. The proposed residential units and elementary school would consume 6,044,736 kWh (6,044.736 megawatt hours [MWh]) per year. This would result in 3,691.03 metric tons of CO_2 Eq per year. Electricity emission calculations are contained in Attachment 2.

It should also be noted that there are legislative and regulatory efforts underway to reduce GHG emissions from electricity. Implementation of the renewable portfolio standard, which requires utilities to purchase 20 percent of their electricity from renewable sources, would reduce GHG emissions by another 13 percent overall. This is not considered in "business as usual" calculations.

4.2.1.2 Natural Gas

GHG emissions resulting from natural gas combustion were estimated using the emission factors developed by the U.S. EPA (1998) and existing natural gas consumption rates. In 2006, the average natural gas consumption rate for a residential consumer was 67,847 cubic feet per year, and the natural gas consumption rate for a commercial consumer was 537,416 cubic feet per year (U.S. DOE 2007). The Proposed Project would consume 57,800,284 cubic feet per year. This would result in 3,165.28 metric tons of CO_2 Eq per year. Natural gas emission calculations are contained in Attachment 2.

4.2.1.3 Water

Water use and energy are often closely linked. The provision of potable water to residents consumes large amounts of energy associated with five stages: source and conveyance, treatment, distribution, end use, and wastewater treatment. This inventory estimated that delivered water for the Proposed Project would have an embodied energy of 2,779 kWh/acre foot or 0.0085 kWh/gallon (Torcellini et al. 2003). The Proposed Project would require 728,000 gallons per day. The embodied energy demand associated with this water use was converted to GHG emissions with the same electrical grid coefficients as the other purchased electricity. This would result in 1,250.33 metric tons of CO_2 Eq per year. Water emission calculations are contained in Attachment 2.

4.2.2 Transportation

Vehicle emissions were estimated using the emission factors developed by the Bay Area Air Quality Management District and the total VMT per day estimated by the URBEMIS 2007 computer program for the Proposed Project. The Proposed Project would generate 8,740 average daily trips (ADT) (LOS Engineering 2009). The EPA estimates that the average fuel economy for passenger cars is 23.9 miles per gallon (mpg) and the

average fuel economy for light trucks is 17.4 mpg (U.S. EPA 2005). The Proposed Project is residential, and the vehicle population would likely consist of passenger cars and light trucks. To be conservative, a fuel economy of 17.4 mpg was used to calculate vehicle emissions. It should also be noted that fuel economy is likely to improve in future years. Vehicle emissions associated with the Proposed Project would generate 16,393.23 metric tons of CO_2 Eq per year. Vehicle emission calculations are contained in Attachment 2.

4.2.3 Solid Waste

The disposal of solid waste produces GHG emissions from anaerobic decomposition in landfills, incineration, transportation of waste, and disposal. It was assumed that multi-family residential developments would generate 1.2 tons per year per unit. The Proposed Project would therefore generate 567.6 tons of solid waste per year. The EPA's WARM was used to calculate the GHG emissions due to solid waste generated by the Proposed Project. WARM divides solid waste into many different categories including yard trimmings, paper products, metals, aluminum, glass, food waste, plastics, and other materials. An estimate of the distribution of these materials was obtained from the U.S. EPA (2008). WARM input and output are contained in Attachment 3. The solid waste associated with the Proposed Project would generate 342 metric tons of CO_2 Eq per year.

4.2.4 Total GHG Emissions

Table 3 shows the projected GHG emissions, expressed as equivalent CO_2 (CO_2 Eq) emissions, resulting from the Proposed Project under "business as usual" conditions.

TABLE 3
"BUSINESS AS USUAL" GHG EMISSIONS
(metric tons/year)

Emission Source	CO_2	N_2O	CH_4	Total CO_2 Eq[1]
Electricity Usage Emissions	3,674.07	0.05	0.03	3,691.03
Natural Gas Usage Emissions	3,146.13	0.06	0.06	3,165.28
Water Usage Emissions	1,244.59	0.02	0.01	1,250.33
Vehicular Emissions	16,331.83	0.17	0.46	16,393.23
Solid Waste Emissions	Na	Na	Na	342.00
Total CO_2 Eq[1]				24,841.87

[1] Equivalent - Totals may vary from the sum of the sources due to independent rounding.

As shown, the Proposed Project is projected to emit 24,841.87 metric tons of CO_2 Eq per year under "business as usual" conditions.

5.0 SUMMARY OF RECOMMENDED PROJECT DESIGN FEATURES, IMPACTS, AND MITIGATION MEASURES

There is no set threshold for GHG emissions; however, given the State's mandated goal of reducing statewide GHG emissions to 1990 levels, the report, *The California Environmental Quality Act; Addressing Global Warming Impacts at the Local Agency Level* (State of California 2008) provides a list of measures appropriate for the Proposed Project that minimizes the significant effect of global climate change. The Proposed Project, as planned, incorporates many of these measures. With the implementation of

these measures, global climate change impacts from the Proposed Project would be less than significant.

As discussed above, the CEC recommends a Tier II goal for residential and commercial projects of a 30 percent reduction in building combined space heating, cooling, and water heating energy compared to Title 24 standards. As a project design measure, the Proposed Project would increase energy efficiency 30 percent beyond that required by Title 24. Therefore, GHG emissions due to energy use would be less than significant.

The following measures have been incorporated into the project design to increase further increase energy efficiency and decrease "business as usual" emissions due to transportation, water use, waste, and construction.

Energy Efficiency

- Build homes that comply with the U.S. EPA's Energy Star criteria, which results in homes that are at least 30% more energy efficient than required by Title 24.

- Outdoor and indoor shaded areas have been implemented into the design of the multi-family planning areas to reduce energy use. Large parking lots have been avoided and plantings throughout the site will provide comfortable living spaces, while reducing energy consumption.

- The compact nature of the Proposed Project and the provision of extensive trails and sidewalks will encourage residents to walk and bike within the community, thus minimizing energy usage.

- The Proposed Project will minimize site lighting to that necessary for security, safety, and identification.

Water Conservation and Efficiency

- The Proposed Project will use reclaimed water to irrigate HOA-maintained common areas and retained agricultural groves in dry months.

- By utilizing the new stormwater regulations, more efficient irrigation will be used. This will prohibit a large amount of water running off into the adjacent wetland.

- Homeowners will utilize low water usage appliances.

Of the 728,000 gpd required by the project, the implementation of water conservation and efficiency measures will reduce the overall demand by approximately 25 percent. The amount of delivered water will be further decreased by utilizing recycled wastewater to irrigate the HOA recreational areas, parks, the elementary school fields, common area slopes and existing avocado groves retained on-site. Presently, the existing avocado and citrus groves are irrigated with groundwater on the property. This same groundwater will continue to be utilized on the retained avocado groves during drier months to supplement recycled water supplies, further reducing the delivered water requirement. Finally, the project may offset the remainder of its delivered water requirement by participating in an offset program with the San Diego County Water Authority (SDCWA)

or a Municipal Water District (MWD). The goal of these actions is to achieve a net zero project-wide water demand.

Solid Waste Measures

- The Proposed Project will recycle construction materials as much as possible.
- Recycling bins as well as trash bins will be provided to each resident.
- The Proposed Project will conform to the applicable County recycling activities.

Land Use Measures

- The existing groves and trees along the primary and secondary roadways will be preserved whenever possible, and the design incorporates a full landscape plan to provide streetscape landscaping and landscaping throughout the Proposed Project. 49.3 acres of groves will also be retained.
- The design has incorporated the existing hiking and horse trails, the existing access driveways, the connection of roads through neighboring properties and to the two adjoining active projects, and keeps much of the existing agriculture.

Transportation and Motor Vehicles

- Bike lanes and trails and pathways are designed throughout the subdivision to promote non-motorized transportation.
- The design of Meadowood encourages residents to walk and bike through their neighborhoods to the school, park and town center and commercial areas located in adjacent projects.
- Accessible walkways and trails are provided from the residences to transit service. Several wide accommodating walkways and trails are provided throughout the Proposed Project to provide accessibility to the residents of Meadowood.
- Circulation within the Proposed Project is accomplished using a system of efficient roadways combined with a trail and sidewalk system for bike and pedestrian use. Interior roads link through the Proposed Project, Campus Park and the Campus Park West properties allowing residents easy access to the planned town center and commercial areas located in these other projects.
- Bicycle riding is encouraged with designated bike lanes along the roadways and a separate 10-foot wide multi use, non-motorized trail along Horse Ranch Creek Road to encourage biking to the town center or to the college campus.

6.0 REFERENCES CITED

Bay Area Air Quality Management District (BAAQMD)

2006 Source Inventory of Bay Area Greenhouse Gas Emissions. November.

California, State of

2008 Preliminary Draft Staff Proposal: Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act. California Air Resources Board. Released October 24.

LOS Engineering, Inc.

2009 Draft Traffic Impact Study for Meadowood (TM5354 & GPA04-02). January 26.

Rimpo and Associates

2007 URBEMIS 2007 for Windows, Version 9.2 Emissions Estimation for Land Use Development Projects. September.

Torcellini, P., Long, N., and Judkoff, R.

2003 Consumptive Water Use for U.S. Power Production. Technical Report # NREL-TP-550-33905. National Renewable Energy Laboratory. Golden, CO.

United States Department of Energy (U.S. DOE)

2002 *Updated State-level Greenhouse Gas Emission Coefficients for Electricity Generation 1998-2000*. Energy Information Administration, Office of Integrated Analysis and Forecasting, Energy Information Administration. April. Obtained from the DOE website at http://tonto.eia.doe.gov/FTPROOT/environment/e-supdoc-u.pdf on February 16, 2007.

2006 Basic Energy Statistics. Energy Information Administration. Obtained from the DOE website at http://www.eia.doe.gov/neic/quickfacts/quickelectric.html on January 28, 2008.

2007 Natural Gas Annual 2006, Table 1. Energy Information Administration, Office of Oil and Gas. Obtained from the DOE website at http://www.eia.doe.gov/oil_gas/natural_gas/data_publications/natural_gas_annual/nga.html on January 28, 2008.

U.S. Environmental Protection Agency

1998 *AP 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Sources*, Section 1.4, Natural Gas Combustion. July.

2002 *Greenhouse Gases and Global Warming Potential Values – Excerpt from the Inventory of U.S. Greenhouse Emissions and Sinks: 1990-2000*. U.S. Greenhouse Gas Inventory Program, Office of Atmospheric Programs. April.

2005 Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle. EPA420-F-05-004. Office of Transportation and Air Quality. Obtained from the EPA website at http://www.epa.gov/OMS/climate/420f05004.pdf on January 28, 2008.

2008 Waste Reduction Model. Obtained from the EPA website at http://www.epa.gov/climatechange/wycd/waste/calculators/Warm_home.html.